

FINAL TECHNICAL REPORT

Stochastic Forcing of Quasi-Geostrophic Eddies (ONR Contract #: N00014-91-J-1778)

Peter Müller, PI
Department of Oceanography
1000 Pope Road, MSB 307
University of Hawaii
Honolulu, HI 96822
Phone: (808) 956-8081
E-mail: pmuller@iniki.soest.hawaii.edu

The overall objective of this project was to understand to what extent the low frequency variability in the ocean is due to stochastic atmospheric forcing. Specifically, the project aimed at:

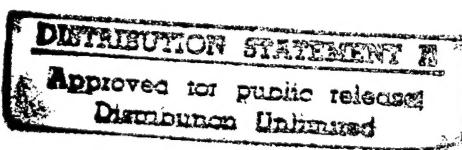
- confirming the notion that most of the large-scale barotropic quasi-geostrophic eddy field in the deep ocean away from unstable mean currents is stochastically forced by fluctuations in the atmospheric windstress, and
- exploring the extent to which the low frequency variability found in coupled ocean-atmosphere general circulation models is stochastically forced.

The following specific tasks were completed:

- Determination of the Green's function for barotropic Rossby waves in a basin, channel, and an infinite ocean.
- Comparison of coherence maps observed during BEMPEX (Barotropic Electromagnetic and Pressure Experiment) with those obtained from a stochastic forcing model developed by the PI
- Analysis of the output from a 1000y run of a coupled ocean-atmosphere general circulation model (the Millennia run) and comparison with the stochastic forcing model developed by PI.

The results have been, or will be published in:

1. Lippert, A. and P. Müller, 1995: Direct atmospheric forcing of geostrophic eddies, Part II: Coherence maps. *J. Phys. Oceanogr.*, 25, 106-121.
2. Müller, P., 1996: Stochastic forcing of quasi-geostrophic eddies. In: *Stochastic Modeling in Physical Oceanography*. Birkhäuser. (accepted)
3. Müller, P., 1996: Stochastic forcing of oceanic motions. In: *Stochastic Models in Geosystems*. IMA volumes, Springer-Verlag. (accepted)
4. Frankignoul, C., P. Muller, and E. Zorita, 1996: A simple model of the decadal response of the ocean to stochastic wind forcing. *J. Phys. Oceanogr.* (to be submitted)



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DEPARTMENT OF THE NAVY
OFFICE OF NAVAL RESEARCH
SEATTLE REGIONAL OFFICE
1107 NE 45TH STREET, SUITE 350
SEATTLE WA 98105-4631

IN REPLY REFER TO:

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ONR 247

11 Jul 97

From: Director, Office of Naval Research, Seattle Regional Office, 1107 NE 45th St., Suite 350,
Seattle, WA 98105

To: Defense Technical Center, Attn: P. Mawby, 8725 John J. Kingman Rd., Suite 0944,
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Subj: RETURNED GRANTEE/CONTRACTOR TECHNICAL REPORTS

1. This confirms our conversations of 27 Feb 97 and 11 Jul 97. Enclosed are a number of technical reports which were returned to our agency for lack of clear distribution availability statement. This confirms that all reports are unclassified and are "APPROVED FOR PUBLIC RELEASE" with no restrictions.
2. Please contact me if you require additional information. My e-mail is *silverr@onr.navy.mil* and my phone is (206) 625-3196.

Robert Silverman
ROBERT J. SILVERMAN



University of Hawai'i at Mānoa

School of Ocean and Earth Science and Technology

Department of Oceanography

1000 Pope Road • Honolulu, Hawai'i 96822

Telephone: (808) 956-7633 • Facsimile: (808) 956-9225

February 20, 1996

Defense Technical Information Center
Cameron Station
Building 5
Alexandria, VA 22304-6145

To Whom It May Concern:

Enclosed please find a copy of the final technical report for the project entitled, "Stochastic Forcing Quasi-Geostrophic Eddies," by Peter Muller. This report is for research funded by the Office of Naval Research, Grant No. N00014-91-J-1778.

Sincerely,

A handwritten signature in black ink, appearing to read "Sharon Sakamoto".

Sharon Sakamoto
Assistant to P. Muller